

Listing of the Claims In the Application

1. (Currently amended): A hydraulically actuated medical instrument, comprising:

an elongated shaft including a proximal end and a distal end;

an end effector at the distal end of the elongated shaft; and

a handle portion at the proximal end of the elongated shaft;

a fluid flow path extending between the handle portion and the end effector through the elongated shaft; and

the end effector including an extensible balloon communicating with the fluid flow path and operable upon pressurization through the fluid flow path to cause an effector action.

2. (Original): The medical instrument of claim 1, further comprising at least one articulation joint located at a selected location between the handle portion and the end effector.

3. (Original): The medical instrument of claim 2, wherein the articulation joint is disposed between the proximal end of the elongated shaft and the handle portion to permit articulation between the elongated shaft and the handle portion.

4. (Original): The medical instrument of claim 2, wherein the articulation joint is disposed between the distal end of the

elongated shaft and the end effector to permit articulation between the elongated shaft and the end effector.

5. (Original): The medical instrument of claim 2, wherein a first articulation joint is disposed between the proximal end of the elongated shaft and the handle portion to permit articulation between the elongated shaft and the handle portion, and a second articulation joint is disposed between the distal end of the elongated shaft and the end effector to permit articulation between the elongated shaft and the end effector.

6. (Original): The medical instrument of claim 1, wherein at least a portion of the fluid flow path is flexible.

7. (Original): The medical instrument of claim 2, wherein the fluid flow path comprises a flexible portion in proximity to the articulation joint.

8. (Original): The medical instrument of claim 2, wherein the articulation joint is adapted to permit 360° of articulation.

9. (Original): The medial instrument of claim 8, wherein the articulation joint is a ball and socket type joint.

10. (Original): The medical instrument of claim 2, wherein the articulation joint is adapted to permit lateral articulation within a plane.

11. (Original): The medical instrument of claim 10, wherein the articulation joint is a hinge type articulation joint.

12. (Original): The medical instrument of claim 2, further comprising a control wire extending between the handle portion and the articulation joint to control articulation of the articulation joint.

13. (Original): The medical instrument of claim 1, further comprising at least a pair of fluid flow paths extending between the handle portion and the end effector through the elongated shaft.

14. (Currently amended): A hydraulically actuated medical instrument, comprising:

a handle portion;

an end effector carried by the handle portion;

the end effector including first and second hydraulic actuators, responsive to changes in hydraulic actuation pressure;

a first hydraulic fluid flow path and a second hydraulic fluid flow path communicating between the handle portion and the first and second hydraulic actuators, respectively; and,

the handle portion including ~~first and second hydraulic pressure sources communicating with the first and second fluid flow paths, respectively, for changing the~~

~~hydraulic pressure within each of the first and second flow paths~~ a hydraulic cylinder block including first and second cylinders communicating, respectively, with the first and second flow paths, and first and second pistons slidably movable with respect to the first and second cylinders, respectively; <sup>br</sup>

first and second members movably mounted and engageable, respectively, with the first and second pistons for moving the pistons relative to the cylinders to change the pressure of hydraulic fluid in the flow paths.

15. (Original): The medical instrument of claim 14, wherein the end effector includes first and second relatively movable jaws.

16. (Original): The medical instrument of claim 15, wherein the first hydraulic actuator is adapted to move the first and second jaws toward and away from one another.

17. (Currently amended): The medical instrument of claim 14 15, wherein the end effector includes a plurality of staples carried by the first jaw and a staple anvil carried by the second jaw.

18. (Original): The medical instrument of claim 17, wherein the plurality of staples are contained in a supply cartridge removably carried by the first jaw.

19. (Original): The medical instrument of claim 17, wherein the second hydraulic actuator is adapted to force the staples from the first jaw and against the anvil of the second jaw.

20. (Original): The medical instrument of claim 19, wherein the first jaw includes a moveable staple ejector and the second actuator includes a linearly extensible balloon engageable with the staple ejector to force the staples from the first jaw upon increase of hydraulic pressure in the balloon.

21. (Original): The medical instrument of claim 16, wherein the first hydraulic actuator includes a longitudinally moveable piston and a connecting linkage associated with the piston and cooperative with each of the first and second jaws to move them toward one another upon increase of hydraulic pressure in the first hydraulic actuator.

22. (Original): The medical instrument of claim 16, wherein the first actuator is biased to a position in which the first and second jaws are spaced apart.

23. (Original): The medical instrument of claim 14, further comprising an articulation joint disposed between the end effector and the handle portion to permit articulation between the end effector and the handle portion.

24. (Original): The medical instrument of claim 23, wherein at least a portion of each of the first and second fluid flow paths are flexible.

25. (Original): The medical instrument of claim 24, wherein the first and second fluid flow paths comprise a flexible portion in proximity to the articulation joint.

26. (Original): The medical instrument of claim 23, wherein the articulation joint is adapted to permit 360° of articulation.

27. (Original): The medical instrument of claim 26, wherein the articulation joint is a ball and socket type joint.

28. (Original): The medical instrument of claim 23, wherein the articulation joint is adapted to permit lateral articulation within a plane.

29. (Original): The medical instrument of claim 28, wherein the articulation joint is a hinge type articulation joint.

30. (Original): The medical instrument of claim 23, further comprising a control wire extending between the handle portion and the articulation joint to control articulation of the articulation joint.

31. (Cancelled).

32. (Cancelled).

33. (Currently amended): The medical instrument of claim ~~32~~ 14, wherein the first piston comprises a plurality of gear teeth, and the ~~lever~~ first engageable member includes a plurality of gear teeth engageable with the gear teeth of the first piston.

34. (Currently amended): The medical instrument of claim ~~31~~, 33 wherein the ~~lever~~ first engageable member is biased to a position of lower hydraulic pressure.

35. (Currently amended): The medical instrument of claim 34, wherein the handle portion further comprises a release tab operable to engage the ~~lever~~ first engageable member to hold it in an increased pressure state.

36. (Currently amended): The medical instrument of claim ~~31~~ 33, wherein the end effector includes first and second relatively movable jaws.

37. (Currently amended): The medical instrument of claim ~~32~~ 36, wherein the ~~lever~~ first engageable member is adapted to move the first and second jaws toward and away from one another.

38. (Cancelled).

39. (Cancelled).

40. (Currently amended): The medical instrument of claim 39 33, wherein the second piston further comprises a plurality of gear teeth and the second engageable member ~~trigger~~ includes a plurality of gear teeth engageable with the gear teeth of the second piston.

41. (Currently amended). The medical instrument of claim 39 40, wherein the handle portion further comprises a safety latch engageable with the second engageable member ~~trigger~~ to hold the second engageable member ~~trigger~~ in a lower pressure position.

42. (Currently amended). The medical instrument of claim 38 40, wherein the end effector includes a first jaw, a second jaw, a plurality of staples carried by the first jaw and a staple anvil carried by the second jaw.

43. (Currently amended). The medical instrument of claim 42, wherein the ~~trigger~~ second engageable member is adapted to force the staples from the first jaw and against the anvil of the second jaw.

44. (Currently amended). The medical instrument of claim 14, wherein ~~the handle portion further comprises:~~



~~a hydraulic cylinder block including first and second cylinders communicating with the first and second hydraulic fluid flow paths, respectively;~~

~~first and second longitudinally moveable pistons slidably movable with respect to the first and second cylinders, respectively;~~

the first engageable member includes a movable lever pivotally mounted and engageable with the first piston for moving the first piston relative to the cylinder block to increase the pressure of the hydraulic fluid in the first fluid flow path; and

the second engageable member includes a trigger pivotally mounted and engageable with the second piston for moving the second piston relative to the cylinder block to increase the pressure of the hydraulic fluid in the second fluid flow path.

45. (Original): The medical instrument of claim 44, wherein the first and second pistons each further comprise a plurality of gears engageable with the lever and trigger, respectively.

46. (Original): The medical instrument of claim 44, wherein the lever is biased to a position in which the first fluid flow path is at a reduced hydraulic pressure state.

47. (Original): The medical instrument of claim 44, wherein the handle portion further comprises a release tab operable to engage the lever when it is in an increased pressure state.

48. (Original): The medical instrument of claim 44, wherein the handle portion further comprises a safety latch engageable with the trigger to hold the trigger in a reduced pressure position.

49. (Original): The medical instrument of claim 44, wherein the end effector includes first and second relatively movable jaws.

50. (Original): The medical instrument of claim 50, wherein the lever is adapted to move the first and second jaws toward and away from one another.

51. (Original): The medical instrument of claim 44, wherein the end effector includes a plurality of staples carried by the first jaw and a staple anvil carried by the second jaw.

52. (Original): The medical instrument of claim 51, wherein the trigger is adapted to force the staples from the first jaw and against the anvil of the second jaw.

53. (Currently amended): A hydraulically actuated end effector for an endoscopic medical instrument, the end effector

comprising a first hydraulic actuator responsive to changes in hydraulic actuation pressure to effect a first selected action and a second hydraulic actuator responsive to changes in hydraulic actuation pressure to effect a second selected action, said first or second hydraulic actuator comprising an extensible balloon to effect the selected action.

54. (Original): The end effector of claim 53, further comprising first and second relatively moveable jaws.

55. (Original): The end effector of claim 54, wherein the first hydraulic actuator is adapted to move the first and second jaws toward and away from one another.

56. (Cancelled).

57. (Cancelled).

58. (Original): The end effector of claim 54, wherein the first hydraulic actuator includes a longitudinally moveable piston and a connecting linkage associated with the piston and cooperative with each of the first and second jaws to move them toward one another upon increase of hydraulic pressure in the first hydraulic actuator.

59. (Currently amended): The end effector of claim ~~55~~ 58, wherein the first hydraulic actuator is biased to a position in which the first and second jaws are spaced apart.

60. (Original): The end effector of claim 54, further comprising a plurality of staples carried by the first jaw and a staple anvil carried by the second jaw.

61. (Original): The end effector of claim 60, wherein the plurality of staples are contained in a supply cartridge removably carried by the first jaw.

62. (Currently amended): The end effector of claim 61, wherein the ~~second hydraulic actuator~~ extensible balloon is adapted to force the staples from the first jaw and against the anvil of the second jaw.

63. (Currently amended): The end effector of claim 62, wherein the first jaw includes a moveable staple ejector and the ~~second actuator includes~~ the extensible balloon is a linearly extensible balloon engageable with the staple ejector to force the staples from the first jaw upon increase of hydraulic pressure in the balloon.

64. (Currently amended): A hydraulic actuation handle for a hydraulically actuated medical instrument, comprising

first and second fluid flow paths;

first and second hydraulic pressure sources

communicating with the first and second fluid flow paths,  
respectively, for changing the hydraulic pressure within each of  
the first and second flow paths, the first and second pressure  
sources comprising a hydraulic cylinder block including first  
and second cylinders communicating, respectively, with the first  
and second fluid flow paths and first and second pistons  
slidably movable with respect to the first and second cylinders,  
respectively; and

means for selectively actuating said first or second  
hydraulic pressure sources by moving one or more of the pistons.

65. (Original): The handle of claim 64, further comprising a  
movable lever cooperative with one of the pressure sources for  
changing the hydraulic pressure in one of the fluid flow paths.

66. (Cancelled).

67. (Currently amended): The handle of claim ~~66~~ 64, wherein at  
least one of the first and second pistons further comprises a  
plurality of gear teeth and the ~~lever~~ means for selectively  
actuating includes a plurality of gear teeth engageable with the  
gear teeth of the piston.

68. (Currently amended): The handle of claim ~~65~~ 64, wherein the ~~lever~~ means for selectively actuating is biased to a position of lower hydraulic pressure.

69. (Currently amended): The handle of claim ~~65~~ 64, further comprising a release tab operable to engage the ~~lever~~ actuating means to hold it in an increased pressure state.

70-79. (Cancelled).

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